



## Three new flexiTIM™ signal processors and a general-purpose vibration transducer are now available

by Ken Milam

Sr. Marketing Engineer  
Bently Nevada Corporation

**T**he flexiTIM (flexible Transducer Interface Module) now provides three new measurement parameters to the Trendmaster® 2000 System: Temperature, Pressure and High Frequency Vibration. These new flexiTIM units are specifically designed to increase your capability to identify problems with your machinery assets, in the context of a low cost monitoring solution.

For many years, our customers have used Trendmaster 2000 systems for effective management of general-purpose and balance-of-plant rotating machinery. Our new flexiTIM significantly reduces the installation costs associated with an online system enabling you to justify monitoring additional pieces of machinery that were previously considered too expensive to instrument. For more information on the economic impact of the flexiTIM product line, see the December 1997 Orbit.

### Temperature

The Temperature flexiTIM accepts inputs from two "J" or "K" type thermocouples. This allows Trendmaster 2000 users to monitor the temperature levels of important

machinery components including thrust bearings, rolling element bearings (bearing cap), and seal flush fluid. A combined vibration and temperature monitoring strategy has proven to be so successful, that many plants now specify this application on all American Petroleum Institute (API) centrifugal pumps.

### Pressure

The Pressure flexiTIM accepts two pressure transducer inputs for the Trendmaster 2000 System. Its high reliability and economical price make it an ideal choice for a diverse range of industries and

applications. Bently Nevada is working on a strategy to detect mechanical seal problems on non-critical machines before failure occurs. This strategy combines information from the Temperature and Pressure flexiTIM. This will let the Trendmaster 2000 System help you reduce safety and environmental problems created by fugitive emission releases associated with mechanical seal failure.

### High Frequency

The High Frequency flexiTIM processes signals from two of the new high frequency acceleration

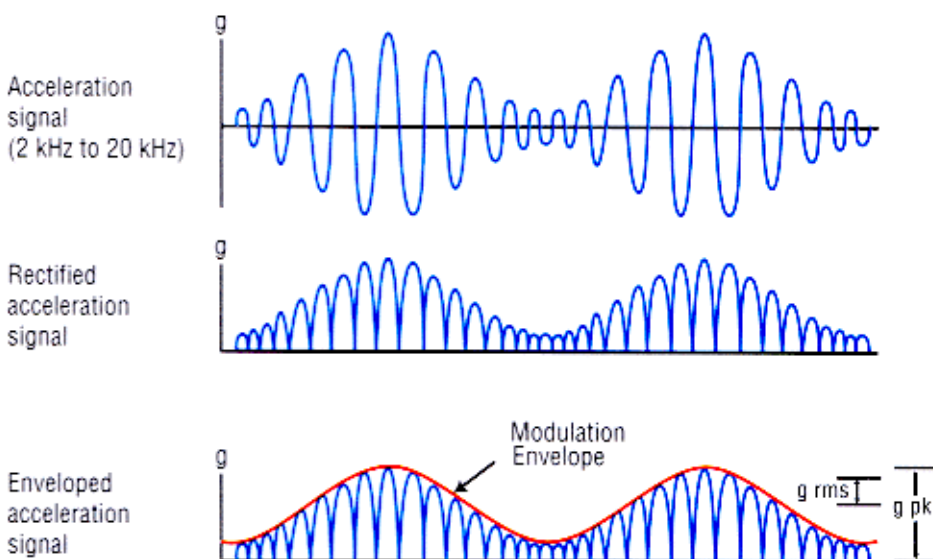


Figure 1

HF flexiTIM high frequency acceleration measurements.

transducers. This flexiTIM and transducer combination have been designed to provide signal processing strategies to detect machinery problems associated with high frequency vibration. These problems include pump cavitation, impeller rubs, and gearbox damage.

In some cases, pump cavitation or impeller rub is regular and severe enough to significantly reduce a pump's life and increase the risk of catastrophic failure. By providing a reliable way to identify a pump's condition, the Trendmaster 2000 System can help assure corrective action is taken before damage is done.

In a similar manner, gearbox failure can be rapid. By monitoring the overall and the modulating acceleration signals from the gearbox, problems resulting from misalignment, unbalance, gear wear, and cracked teeth can be quickly identified and corrected.

The High Frequency flexiTIM and transducers measure acceleration signals from 2 kHz to 20 kHz. By rectifying and peak detecting this acceleration signal, the enveloped acceleration signal is created (Figure 1). This enveloped acceleration signal represents high frequency vibration modulations which are often created by machinery impacts, and is presented in the Trendmaster 2000 system using the following display formats:

#### Static

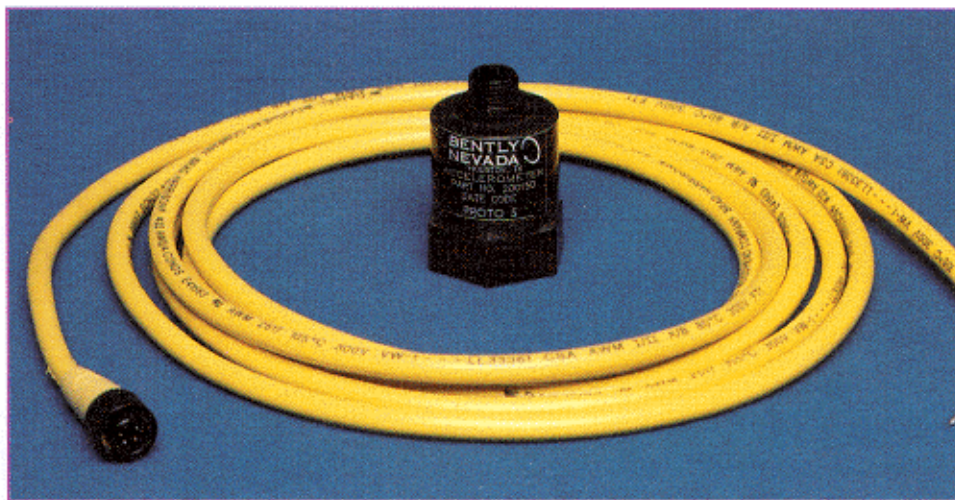
***g pk***-The peak amplitude of the acceleration signal.

***g rms***-The rms amplitude of the acceleration signal's modulation.

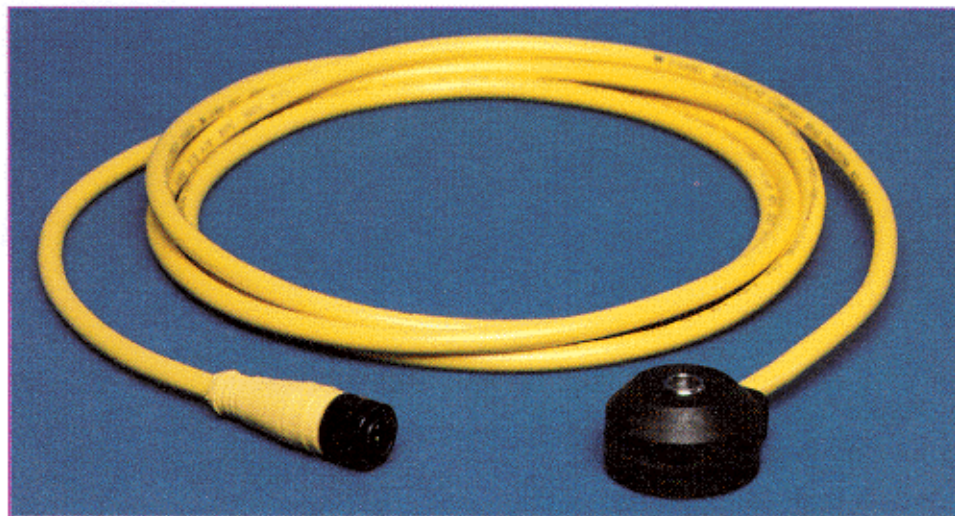
#### Dynamic

***Timebase***-The waveform of the acceleration signal's modulation.

***Half Spectrum***-The FFT of the acceleration signal's modulation.



General-purpose vibration transducer



High frequency acceleration transducer

#### New, general-purpose vibration transducer

In a continuous effort to improve transducer technology, Bently Nevada has released a new general-purpose vibration transducer designed for use with the Acceleration-to-Velocity flexiTIM, and 1900/25 and 1900/27 Vibration Monitors. The new general-purpose vibration transducer is housed in a smaller, more reliable package, and uses a sealed, top-exit connector.

The transducer is a piezoelectric accelerometer housed in a transfer-molded case. Quick disconnect connectors on the flexiTIM and general-purpose transducer reduce installation and maintenance costs and provide a

solution for limited-space installations. In addition to the interconnect cables available with the general-purpose vibration transducer, an extension cable is available for 1900/25 and 1900/27 installations.

#### Customer feedback

Our product development is quicker and easier, due to the standardized design approach of the flexiTIM. You can now participate in the process of identifying and defining enhancements! If you have identified a need or have an idea for a new flexiTIM measurement or transducer interface, contact your nearest Bently Nevada sales representative. [Q](#)